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Behavior-Analytic Repertoires: Where Will They Come From and How Can They Be Maintained?

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The field of behavior analysis faces a number of issues concerning its existence as a discipline and as a profession, including (a) identification of the knowledge and skills comprising the repertoire of competent behavior analysts, (b) the nature of the curricula that will produce the scientists and practitioners needed by the discipline, (c) identification of the generic professional and social skills required for any successful professional career, (d) academic employment opportunities for behavior analysts, and (e) the maintenance of behavior-analytic repertoires. Recommendations are offered as possible solutions to problems raised with respect to each of these issues.

Key words: curriculum, degrees in behavior analysis, behavior-analytic skills, continuous learning community, placements, professional preparation

The points of view presented in this paper are predicated on several assumptions. First, behavior analysis is a discipline characterized by a philosophy of science indigenous to the science itself, basic and applied research programs with methodologies uniquely suited to its subject matter, a core of scientific principles derived from that research, and assorted technologies for applying the principles to bring about behavior change in a variety of settings. Second, we believe that humanity will benefit if large numbers of people become behavior-analytically literate. A third assumption is that the future existence of behavior analysis rests on the transmission of its scientific and technological practices to a growing number of behavior analysts, some of whom will, in turn, spend a significant portion of their professional careers teaching those practices to the next generation of behavior analysts.

WHAT IS A BEHAVIOR ANALYST?

What all behavior analysts have in common is their disciplinary core (Glenn, 1993). Whether they function as scientists or as practitioners, as psychologists, educators, social workers, or simply behavior analysts, they focus on relations between behavior and environment and the principles that describe those relations. Their common interest is in changing the environment to bring about changes in behavior.

Among scientists, basic researchers change the environment of subjects in experimental laboratories in order to formulate generalizable principles. Applied researchers change the environment of persons in field laboratories or natural settings in order to test the generality of the principles with regard to particular behavioral content or to evaluate the effectiveness of particular kinds of interventions (cf. Johnston, 1993). Practitioners are consumers of the products of applied and basic research; based on their knowledge of the principles and the findings of basic and applied research, they change the environment of people in the everyday world to bring about more productive, socially enhancing behavior in the workplace, homes, clinics, and schools. Whether trained in a department of psychology, education, human development, or behavior analysis, behavior analysts are likely to have more in

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common with one another than they have with any other group of scientists or professionals. The increasing number of employers who advertise for behavior analysts to fill various positions seem less interested in where their employees studied, or in the name of the degree program, than in their knowledge of behavior analysis.

NEED FOR DEGREES IN BEHAVIOR ANALYSIS

As the public becomes aware that many of society's most serious problems can be solved only by changing the behavior of its members, there is increasing interest in the services of professionals who can bring about behavior change: Schools want improved academic performance from their students and better teaching performance from their teachers; physicians want healthful behavior from their patients; employers want more productive behavior from their workers; parents want more responsible behavior from their children; the list goes on. Although behavior analysts have demonstrated that they can bring about all of those kinds of behavior change, there are not enough behavior analysts in the world to make a dent in the problems human societies face. One way society can improve its chances of solving some of its problems is to increase the number of behavior analysts it educates (cf. Heward & Malott, 1995). The problem is that the mechanisms for that are not in place.

The body of knowledge comprising behavior analysis may now be larger than can be acquired during a single lifetime. To become well educated in the discipline requires intensive preparation under the tutelage of experts—roughly comparable, perhaps, to that needed for a career as a scientist or practitioner in many of the biomedical fields.

We believe that society would be well served if more universities offered degrees in behavior analysis at all levels. Such offerings are not possible now because there are not enough properly trained behavior analysts to staff that many degree programs. The way to get started appears to be to staff as many programs as possible at all levels of higher education, both undergraduate and graduate. The goals of undergraduate programs should be to prepare students to serve as technicians under supervision of a behavior analyst and to prepare for graduate programs in behavior analysis. Master's programs should prepare students to function as practitioners in developing behavioral interventions and supervising technicians in carrying them out, prepare them for doctoral training in behavior analysis or in related fields, and prepare them to teach behavior analysis at the high school level. Doctoral programs should prepare students to teach behavior analysis at the college level, to do basic and applied research in settings ranging from universities to business or industrial settings, and to serve as administrators and supervisors in agencies, schools, and other facilities (cf. McClannahan & Krantz, 1993).

Degrees in behavior analysis can be developed in various traditional academic departments (e.g., special education, psychology, and social work) or offered in departments of behavior analysis or interdepartmental programs. All of these programs currently exist and are likely to be critical to the future of behavior analysis. The key element in any academic program is a faculty whose expertise combines to provide a comprehensive program that covers all the components of behavior analysis. We now turn to this topic.

General Composition of Behavior Analysis Curricula

Minimum requirements for a master's degree program of study in behavior analysis have been specified by the Association for Behavior Analysis and include the following curriculum components:

(a) the principles of behavior; (b) within-subject research methodology and direct observation of behavior; (c) conceptual issues; and (d) behavioral interventions with such possible emphases as behavior therapy, behavioral teaching, and behavioral medicine. The standards further specify a thesis, review paper, or general examination whose questions and methods are based on a behavior-analytic approach to problems or issues. (Hopkins & Moore, 1993, p. 118)

At the doctoral level, minimum standards are a continuation of those at the master's level and include advanced curriculum topics in

(a) one or more specialized areas of the nonhuman and/or human basic research literature, (b) research methods, and (c) one or more areas of the applied behavioral literature. The standards . . . further specify a doctoral dissertation whose questions and methods are based on a behavior-analytic approach to problems and issues. (Hopkins & Moore, 1993, p. 118)

Even if one were to assume that curriculum topics in each of these areas involve an amount of time equal to a single course, few universities offer the equivalent of four courses in behavior analysis; thus, those minimum requirements seem like a good place to start. However, few people are likely to think that a person could be trained as a scientist or a practitioner in any discipline with the equivalent of only four courses in the discipline. Although it is certainly the case that much of graduate-level training is in the mentoring and supervising of students, formal course work provides the foundation for that individualized training. Graduate-level training usually takes for granted a core of knowledge acquired at the undergraduate level. In behavior analysis, that training cannot be taken for granted, and some of it usually must be provided at the graduate level.

A Sample Behavior Analysis Curriculum

Perhaps because behavior analysis is still a relatively young discipline, little systematic attention has been given to developing comprehensive curricula across all academic levels. Here, we present our own preliminary views of what such comprehensive curricula would be like. These views are general rather than specific because we believe that the particulars of a curriculum in behavior analysis depend on the faculty who develop it.

A baccalaureate in behavior analysis might have a 30 semester-credit-hour major, with a strong emphasis on science, math, and writing among general studies courses. Students could select secondary emphases from among behavioral, cognitive, and social sciences, computer sciences, and from among specialty areas such as business, criminal justice, rehabilitation, and gerontology. The 30 hr of behavior analysis could include two introductory courses on basic principles, a course or two on scientific methods of the discipline, and a course on conceptual issues. Almost all courses would have laboratory or field-work components so that practicum experiences that focused on appropriate use of the technology would be distributed throughout the curriculum.

A master's level curriculum could include advanced courses on behavioral principles and methods, survey courses in the basic and applied research literatures, a course on behavior-analytic theory and philosophy, a course on verbal behavior, and courses pertinent to program development in various areas of application (e.g., developmental disabilities, instructional technology, etc.), and on staff training and supervision and organizational behavior management. We favor a thesis requirement, but developers of other programs may not. Extensive practical experience in applied areas is necessary to ensure that students learn enough particulars to enable them to function effectively in one or more applied areas. Students graduating with a master's degree would be behavior analyst practitioners who could design interventions and supervise behavior technologists in carrying them out. They could conduct applied research where interest and opportunity allowed. They would also be prepared to

make maximum use of doctoral training programs.

If students enter doctoral programs with the kinds of repertoires trained in the curricula just described, their doctoral work could focus on research in the particular area in which they wanted to work. Doctoral students would hone their conceptual skills in seminars and in writing area papers. Such is the case in other sciences, where students receive their general training in the discipline before they begin their doctoral training and thereby are able to concentrate, during their doctoral studies, on a particular area of research, to become experts in that area, and to develop their teaching skills as well. Doctoral students whose interest lies primarily in training future students as practitioners and behavior technologists could hone their teaching skills and their own technological expertise.

KNOWLEDGE AND SKILLS REQUIRED IN THE WORKPLACE

Behavior-Analytic Skills

Behavior-analytic skills is a general label covering a large repertoire of verbal and nonverbal behavior. Although the relative importance of academic knowledge (knowing that) versus practical knowledge (knowing how) of behavior analysis has been debated (e.g., Baer, 1981; Michael, 1980), it seems self-evident that these two kinds of skills support one another in almost all professional endeavors. Practitioners who can talk a good game (e.g., review the literature, explain how to do reinforcer assessments, make a list of interventions that have been effective with self-injurious behavior) must also be able to see reinforcement at work in the everyday world, to ascertain what events to use in a reinforcer assessment, and to identify what stimulus control is lacking in a specific learner's repertoire.

Favell, Favell, Riddle, and Risley (1984) noted that individuals who are highly qualified as professionals (e.g., teachers, social workers, and psychologists) are not necessarily skilled in areas that require interactions with others (e.g., management). Although some faculty may consider training such skills beyond their responsibilities (and may even model unskillful behavior in this domain), it is clearly to the advantage of graduates and to the discipline that behavior analysts make use of behavior-analytic principles to bring about positive changes in their own work environments.

Graduates who will be working as researchers must acquire research skills by doing research during their academic training. Likewise, students planning to teach would benefit from training in the particular skills of teaching behavior analysis. No other discipline has the advantages that behavior analysis has in preparing its future teachers to advance their discipline through teaching. Educational technologies such as the personalized system of instruction (e.g., Keller, 1968), precision teaching (e.g., Lindsley, 1992), direct instruction (e.g., Engelmann & Carnine, 1982) the Morningside model (Johnson & Layng, 1992), and a systematic approach to thesis and dissertation supervision (Malott, Malott, & Brethower, 1988) can all be used or adapted for use in teaching behavior analysis at the undergraduate and graduate levels.

In summary, a behavior analyst's primary professional responsibility may be to conduct research, to develop and implement interventions, to teach, or to supervise or manage the performance of others. In any case, that individual and the discipline itself will be well served if the behavior analyst has acquired a full repertoire of behavior-analytic skills.

General Performance, Professional, and Social Skills

Many of the skills widely recognized as being critical to successful employment in almost all settings are so general that they are rarely considered to be the responsibility of specific

training programs. From our perspective, it is unlikely that any academic program can assume full responsibility for teaching these skills if students have serious deficits upon entering. Even so, these skills can be strengthened and honed in the context of academic training; we believe that it is to the advantage of students, academic programs, and the discipline itself to do so. A brief description of these skill categories follows.

General performance and work-ethic skills. This category includes such skills as timely completion of assignments, accurate instruction following, working without supervision, coordinating activities of a group, punctuality and dependability, and say-do correspondence. These skills are generic in the sense that the student should demonstrate the skills across settings, across tasks, and across supervisors and teachers. All of these skills are highly pertinent to success in the work world. They could probably be strengthened if students' grades in various courses were contingent on demonstration of these skills as well as on the specific knowledge being taught in the courses.

Professional skills. In this category, we include those skills that any professional is expected to have, independent of the discipline in which he or she is trained: (a) computer literacy, (b) ability to speak and write clearly, (c) ability to consider ethical issues pertaining to plans and programs, (d) ability to supervise or manage the performance of others, (e) ability to organize disparate and even conflicting information so that effective action is possible, (f) use of appropriate professional attire and professional manners, (g) ability to prepare a resume, and (h) skills in avoiding gossip.

Social skills. Social skills are closely integrated with professional skills in the workplace, but they occur in a broader context across and outside of the workplace. Behavior analysts without good social skills can damage the discipline in subtle and important ways. For example, a person who is rude to his or her child's teacher may affect how the teacher talks about behavior analysis (if the teacher knows the parent is a behavior analyst).

Social skills include behavior that disposes others to grant a request, to agree to a planned course of action, to cooperate in carrying out a plan, or to respond favorably to suggestions to change a course of action. Social skills also include those types of behavior generally labelled polite and considerate. Both of these categories of social skills subsume a myriad of activities such as eye contact, positive affect, listening carefully to others, recognizing behavior that contributes to the effectiveness of one's organization and one's discipline, and responding politely but differentially to those behaviors when they are observed.

Like general performance skills, social skills can be systematically strengthened in the course of academic training. This will require that faculty, at a minimum, recognize the modeling functions of their own behavior, provide constructive feedback for students who demonstrate social skills deficits, and provide differential reinforcement for student demonstrations of socially skillful behavior.

APPROPRIATE PLACEMENTS FOR GRADUATES

The youth of the discipline, the lack of a professional identity, and the scarcity of academic programs in behavior analysis contribute to a lack of appropriate employment opportunities in higher education for behavior analysts. The PhD graduate rarely has an opportunity to teach in a program designed to produce behavior analysts and often must take a position as the token behaviorist in other programs (or worse, hide his or her identity as a behavior analyst in order to obtain an academic position).

There are an increasing number of job openings specifically for MA and PhD behavior analysts with a specialty

in an applied area. Such positions fall into three general categories. First, there are jobs that specify training in behavior analysis but that do not offer opportunities to do behavior analysis in a reasonably effective manner. Behavior analysts who have such positions often are constrained by a system that operates within a philosophy that is inherently non-behavior-analytic or even counter-behavior-analytic. Many behavior analysts working in such settings (e.g., some institutions for the developmentally disabled, state hospitals, and special education classrooms) usually lose contact with their discipline and fail to remain current in its research findings or its theoretical and technological advances.

Second, there are jobs in which highly trained behavior analysts are allowed to practice their profession but there are no support systems for such practice (e.g., many organizational behavior management consulting opportunities). In the absence of a verbal community that maintains the behavior-analytic practices acquired during years of education, even the best behavioral repertoires will drift and erode. Behavior analysts can counter the contingencies maintained by a non-behavior-analytic verbal community by taking every opportunity to interact with other behavior analysts. Until recently, such interaction required proximity; unless one was fortunate enough to live near other behavior analysts, the only opportunity to interact with them was at professional meetings. The advent of electronic mail has made it possible for isolated behavior analysts to remain active and regular participants in a verbal community of behavior analysts.

The third kind of position a behavior analyst can obtain is one in which the entire system is behavior-analytic: All the key players are behavior analysts, a behavior-analytic approach is implemented in carrying out the mission of the system at all levels, and behavior-analytic verbal behavior is continuously shaped and maintained within the system (Johnson & Layng, 1994; McClannahan & Krantz, 1993). There are not many such systems, so one might assume that it would be easy to fill positions. However, adequately trained graduates of behavior analysis programs may not be able to fill those positions because of family circumstances, lack of information about the availability of such positions, or mismatches between particular interests of graduates and the mission of the system. More such systems and more well-trained behavior analysts are both needed.

Development of thoroughgoing behavior-analytic systems has been accomplished by teams of behavior analysts working together to build such a system (e.g., Princeton Child Development Institute, AuClair Programs, Morningside, and Aubrey Daniels & Associates). It might be possible to increase the rate of such development if faculty in academic programs in behavior analysis worked with community leaders, area institutions, and graduate students to set up satellite systems near the university from which the students graduated. A satellite could be set up independently or as a nonprofit extension of the university's behavior analysis program. The satellite would probably be an agency or organization with a specific mission (such as a private school, a halfway house, community homes for persons with retardation, an organizational consulting firm, etc.). Those settings would provide internship opportunities for behavior analysis students, employment for graduating behavior analysts, and opportunities for joint research between practitioners and university faculty. University faculty, students, programs, and associated agencies would form a continuous learning community (CLC). The CLC would enable graduate students to continue developing their behavior-analytic repertoires. Skills that are not academic per se but that are critical for new professionals to acquire (e.g., marketing) could be acquired as part of the CLC's opera-

tions. CLC community outreach services could be made available on a consultant basis to school systems, institutions, large health service provider organizations, and so on.

CLCs would develop feedback loops among professionals in the community, graduate students, and university faculty personnel. They would enable each of these groups to affect the behavior of others in ways that could enhance the growth and development of behavior analysis as a discipline as well as enhance the individual departments and faculty and agencies and their employees. Students would have opportunities to learn lessons that are difficult to teach in classrooms, and professionals would benefit from contact with students who have the latest information available in the discipline. Graduates of behavior analysis programs would have opportunities to continue collaborating on research with faculty, and faculty would remain abreast of research questions important to those working in the field.

These CLCs would become a viable extension of the university, and the university would be responsive to the needs of the community. Graduates who had served as teaching fellows would be available to teach behavior analysis certification courses through the CLC to staff members of various institutions. Graduates interested in combining a research career with their applied interests could, through a CLC, work with faculty and university students and develop and carry out research in their work settings (e.g., school systems, privately funded developmental disability centers, institutions, etc.). The CLC would enable academic faculty and staff to devise and implement sound, consistent maintenance technologies and provide the personnel to make long-term observations and adjustments to ensure stability of the intervention and subsequent maintenance of behavior changes—an area not often addressed in the literature but very important for our discipline.

CONCLUSION AND RECOMMENDATIONS

Behavior analysis may be at a critical crossroads. Survival may depend on achieving several concatenated objectives that are only vaguely recognized as areas needing attention. First, the number of academic programs in behavior analysis must increase, thereby increasing the number of job opportunities for researchers and teachers and the number of training opportunities for students. This is only likely to happen if behavior analysts create opportunities to develop programs in every college and university niche that presents itself. Second, programs in behavior analysis must have curricula of sufficient breadth and depth to produce professional and academic behavior analysts, whatever other professional affiliations they might have. There is no reason to believe that such preparation would require less than the preparation (at the doctoral level) of a physician or a traditional psychologist, or less than the preparation (at the master's level) of a social worker, special educator, or rehabilitation specialist. Third, professional identification of behavior analysts should not be confused with professional identification of other specialists. Although a behavior analyst sometimes may also be a social worker, a psychologist, or a rehabilitation specialist (to name a few), employers who need the skills of a professional behavior analyst must be able to identify them as such. Fourth, in order to enhance the value of behavior analysts to employers as well as to enhance the employment opportunities of graduates, behavior analysis courses might well incorporate contingencies that strengthen social skills and professional skills. Fifth, behavior analysts would do well to maintain professional networks, such as data banks and electronic networks that link and share information among state chapters of the Association for Behavior Analysis, academic programs, and behavior-analytic field settings as well as among in-

dividual faculty, practitioners, and potential employers. One of the main functions of these networks could be to facilitate appropriate placements for graduates. Sixth, through something like CLCs, behavior analysts in the field could remain valuable contributors to the verbal community in which researchers, teachers, and graduate students participate.

Few, if any, behavior analysts may be in a position to implement (or even to see the need for) all the above recommendations. In addition, others may make recommendations that we have overlooked and that would do more to enhance the survival of behavior analysis than any we have mentioned. If the assumptions with which the article began are acceptable, however, it is clear that systematic and concerted effort will be needed if the field of behavior analysis is to reach maturity.

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